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Original Article

The Role of Pain Severity and Fear of Movement on Explanation of Physical Disability in Patients with Chronic Pain

Mina Noori[1], Abbas Pourshahbaz[2 *], Parvaneh Mohammadkhani[3], Reza Salman Roghani[4]

[1] *MS of Clinical Psychology, Department of Clinical Psychology, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.*
[2] *PHD of Clinical Psychology, Department of Clinical Psychology, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.*
[3] *PHD of Clinical Psychology, Department of Clinical Psychology, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.*
[4] *MD, Department of Clinical Sciences, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.*
*(*Corresponding author: Pourshahbaz Abbas, psychology8591@yahoo.com)*

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Abstract

Introduction: Pain is associated with varying degrees of limitation in function. Although many people experience pain, but there is difference in disability. Some think this difference is due to pain severity or psychological variables such as fear of movement. The purpose of this study was to determine the role of pain severity and fear of movement on explanation of physical disability in patients with chronic pain.

Methods: 207 patients with chronic pain (71 men and 136 women) were chosen by purposeful method and pain intensity subscale of multidimensional pain inventory, Tampa Scale for Kinesiophobia (TSK) and Roland Morris Disability Questionnaire (RMDQ) were completed and data were analyzed by regression method.

Results: The mean age of the sample was 44.41 years and main location of pain for most was back (42%) and feet (22.7%). Regression analysis showed that pain intensity and fear of movement explains 33% of the variance in disability. While comparing the zero-order correlation indicates the pain severity is stronger.

Conclusion: Pain severity and fear of movement are effective in disability and it is necessary, especially for treatments that aim to boost or restore the physical ability of patients, attention to them.

Declaration of Interest: None.

Key words: Pain severity, fear of movement, physical disability, chronic pain.

Introduction

Chronic pain is a common problem among adults in many parts of the world (8). Chronic pain itself means no response or little response to available therapies (8). In fact, pain is a mental experience and a complex perceptual phenomenon, and these factors limit the perception of specialists from the pain and efforts they are trying to cure (8). So the better understanding of the mediators associated with chronic pain and disability and the relationship between these mediators can lead to existing therapeutic programs to increase the effectiveness of therapeutic programs.

Studies have shown that in Brazil, 41.4% of people have chronic pain (1), in Australians, also reported 37.1% (2). An Irish study also reported that 35.5% of people have chronic pain and 12% of them were unable to work or reduced their working hours because of chronic pain, as well as 15% of patients with chronic pain have depression, while the rate of

depression among individuals without chronic pain is 2.8% (3). Thus, people with chronic pain are more at risk of depression. In Tehran, a prevalence of 25.5% was reported for chronic pain (4).

Chronic pain also has many physical and psychological effects on patients and their families (5) that can leave them with social and financial problems (5-7). The extent of these problems as well as the costs of treatment may limit the ability of individuals with chronic pain to properly function in their daily lives.

Chronic pain is associated with various degrees of physical disability (2). Disability is a limitation in the physical functioning of patients under pain and the evaluation of the physical activity level of patients with chronic pain has been noted many years ago (10). Recently, International Association for the Study of Pain (IASP) has emphasized on it. In fact, the reviewers of the evaluation of the outcome of chronic pain management in IASP have explicitly stated that evaluation of the level of physical activity of patients with chronic pain should be considered as one of the indicators for assessing the outcome of the treatment (11). Also, patients with chronic pain suffer from various degrees of disabilities (12) and improving or returning to previous performance levels is one of the important points of patients with chronic pain management programs (13).

There are several studies that have emphasized on the role of mediator and demonstrated that there is a small direct relationship between chronic pain and disability (14). Severity of the pain is one of the conditions that make a difference in the incidence or rate of disability among individuals with chronic pain For example, some researchers have proposed that pain severity is associated with more disability (15, 16), but some have emphasized on the role of the patient's beliefs about pain and suggested that therapies that focus on patient beliefs could improve disability in patients with chronic low back pain (17). Among the variables that assess beliefs of the patient with chronic pain, fear of movement, has been recognized as an influential factor and predictor of avoidant behavior or physical disabilities, has attracted much attention in recent years (18).

According to IASP, pain has been defined as an unpleasant sensory and emotional experience with real or potential damage Also, according to the concepts proposed by the IASP, the concept of chronic pain is possible in comparison with acute pain. Chronic pain is an acute pain that lasts longer than expected time. In practice, this time may last from a month to even six months. For pains that are not malignant, usually three-month- long is suitable cut of point, and the pain that lasts more than 3 months is called chronic pain (19).

Fear of movement (re-injury) as a characteristics in patients with musculoskeletal pain was introduced by Kori and his colleagues (year). They have proposed the term kinesiophobia in 1990, and introduced it as an excessive, unreasonable fear of physical movement or activity due to a sense of vulnerability, which can lead to a painful injury or re-injury experience (20). Lethem have suggested fear avoidance model about chronic pain and explained that fear of pain on a spectrum that one side of that is confrontation and the other side is avoidance. While confront with pain decline injury and people resume their normal activities, avoidance causes the physical and psychological condition that these features, in turn, cause abnormal situations and increase the perception of pain (21).

Based on the above model, the first adaptive response to threats (i.e. reducing the level of activity to keep yourself from damage) over time becomes maladaptive responses (avoidance behaviors). This avoidance response can increase fear and pain, which can limit the patient's activities (21). Also, a model about chronic low back pain has been suggested that catastrophic thoughts about the pain and fear of movement will lead to disability (22) and low mood (23).

Although the expression patterns of relation between chronic pain and it’s severity, fear of movement and physical disabilities in some studies have been considered, studies on why people with chronic pain experience varying degrees of disability, as well as attention to the role of psychological variables such as perceived pain severity and the fear of movement in justifying this issue has not been considered (12). On the other hand, results of

the studies on the relationship between pain, fear of movement and disability are not consistent. Some researchers suggest that severity of pain predicts disability and fear of movement (12) and some think fear of movement is mediator in relationship between pain intensity and disability (24). Also, the relationship between these variables in different societies with different cultures and people with different types of chronic pain not only back pain (LBP is desired in many studies) suggests the need for further research in this area, because researches have shown that people with different cultures are different in the perception of pain 25), pain coping strategies (26) and beliefs related to appropriate pain treatment (27). So, the purpose of this study was to determine the role of pain severity and fear of movement in explaining the physical disability among patients with chronic pain in different parts of the body.

Methods

This study is a descriptive study and correlative Statistical population includes individuals aged 18-60 years old with chronic pain who referred to the Akhtar Hospital or Sana clinic in Tehran (between June and December 2014). The sample was selected by convenience method. Questionnaires were provided to patients who had been diagnosed with chronic pain by the physician and had entry criterion for the research (experience pain now for at least 3 or 4 days a week, continuing pain over 3 months, do at least one treatment) and were also interested in participating in the study. 220 participants were selected for research. After completing the sampling process, 13 participants were eliminated due to incomplete answers to questionnaires, and 207 patients entered the data analysis phase. The questionnaires used in this study are: Pain intensity subscale of Multidimensional Pain Inventory, Tampa Scale for Kinesiophobia (TSK) and Roland and Morris disability scale.
It should be noted that for data analysis, the enter multiple regression method has been used and the data have been analyzed using SPSS۱۹ software.

Measurement Tools

1) Pain severity: Pain intensity subscale of West Haven-Yale Multidimensional Pain Inventory is composed of three sentences that consider pain as a multidimensional phenomenon. This subscale measures the pain severity of a person when completing this subscale, and in the last week, and the torment that a person suffers from pain. Ranges of this scale is ranges of this scale are from 0 to 6 and higher scores indicates higher levels of pain. Reliability and validity of all subscale have been confirmed (28). Asghari Moghadam and Golak (29) reported 0.84 internal consistency and confirmed validity. Internal consistency in the current sample was 0.83.
2) Fear of movement: The Tampa Scale for kinesiophobia (TSK) was designed to measure fear of movement/ (re)injury in individuals with pain (30). The initial scale TSK has 17 item, but later the forms are including 4 item (31), 11 items (32) and 13 items (33) were accepted and used. The results of the internal consistency analysis of all phrases in this study using Cronbach's alpha showed that the items 5, 8, 12, and 16 reduce the internal consistency of the scale, which indicates a better acceptance of the form including 13 item. Also, more studies (especially in Iran) emphasizes on 13 item, which is called TSK-2 (33-36). Reliability and validity of this form are approved (33-35), and internal consistency in the current sample was 0.76 too.
3) Physical disability: The Roland Morris Disability Questionnaire (RMDQ) was developed to measure perceived disability in individuals with pain (11). The RMDQ consists of 24 items Psychometric properties (reliability, validity and sensitivity to change in therapy) of RMDQ in patients with chronic pain have been confirmed (10). Asghari reported 0.88 internal consistency and 0.90 reliability (test-retest) for it (37). Internal consistency in the current sample was 0.88.

Results

Participants included 71 men (34.3%) and 136 women (65.7%) were 18 to 60 years old with mean age of 44.41. Table 1 shows the frequency and percentage of the original location of pain in the participants. The duration of pain among patients was variable from 3

months to 360 months (30 years) (m= 53.40, SD= 68.48).

Table1: frequency and percentage of the original location of pain

location	frequency	%	location	frequency	%
neck	18	8.7	back	87	42
chest	1	0.5	shoulder	15	7.2
hands	13	6.3	pelvis	17	8.2
other	9	4.3	legs	47	22.7

Table 2 shows mean and standard deviation of variables. Pearson correlation test showed that there is significant positive correlation between each of the predictor variables (pain severity and fear of movement) and disability (respectively 0.49 and 0.46). Also there is significant positive correlation between pain severity and fear of movement (0.36).

Table2: Mean and standard deviation of variables

variable	M	SD
disability	9.58	5.60
pain severity	4.02	1.38
fear of movement	19.56	5.80

Regression analysis was used to determine the proportion of pain severity and fear of movement in explaining the variance of physical disability. Results are summarized in Table 3.

Table 3: Results of enter multiple regression for pain severity and fear of movement, predicting physical disability

model	variable	B	SEB	Beta	R^2	adjusted R^2	t	sig	zero-order correlation	partial correlation
1	constant	-2.77	1.27				-2.18	0.03		
	fear of movement	0.32	0.06	0.33	0.34	0.33	5.42	0.0001	0.46	0.35
	pain severity	1.51	0.25	0.37			6.09	0.0001	0.49	0.40

As Table 3 shows, when fear of movement and pain severity enters the regression, adjusted R2 is 0.33, which means that 33% of the variance of disability is explained by fear of movement and pain severity.

To determine the role of each of the predictor variable in explanation of disability compare zero-order correlation. When zero-order correlation is used we sought to investigate the role of a variable regardless of other variables, while in partial correlation, it is considered to remove the effects of other variables. In this study zero-order correlation of pain severity with criterion variable means disability is 0.49 that tells us correlation between pain severities (without excluding the common effect with fear of movement) with a physical disability is 0.49. Zero-order correlation of fear of movement with disability is also 0.46 .Which means that fear of movement without controlling common correlation with pain severity had positive correlation of 0.46 with disability. As a result, the role of pain severity in explaining of disability is a little more than fear of movement, however, this difference is very small and looking for these two variables can be considered as equal role.

However, due to the correlation between pain severity and fear of movement is 0.36 overlap between these two variables is not enough to be considered as one factor, so as the regression result shows, being two variables together lead to complete explanation of disability.

Discussion

The aim of this study was to determine the role of pain severity and fear of movement in explaining of physical disability in patients with chronic pain. The results showed that there is significant positive relationship between pain severity and disability, as well as between fear of movement and disability. Although the relationship between disability and pain severity is stronger than the relationship with fear of movement, it also became clear that pain severity was explaining a significant variance

of disability. In fact pain severity is explaining more variance of disability compared with fear of movement. This outcome is in line with findings of Gauntlett Gilbert and Eccleston (38). They concluded that the severity and duration of pain and the patient's age could explain 27 percent of the disability while pain was significant only in the regression analysis (38). Silva and his colleagues also concluded that pain severity alone can explain 27% of disabilities reported by adults with chronic musculoskeletal pain and 18% of dysfunction due to the disability (16). These researchers also researched about adults older than 50 years with chronic musculoskeletal pain suggested that pain severity is the most important predictor of disability in various areas of life, including physical function (15). However, results of some studies are not consistent with our study (39) This study suggests that fear of movement in explanation of physical disability is more important. Research on patients with sub-acute and chronic musculoskeletal pain showed that beliefs related to pain (such as self-efficacy and fear of movement) are more successful than pain severity in explanation and predicting disability (39).

Base on the result of this study the role of pain severity in explaining of disability is more than fear of movement, but it has a little difference. Also the correlation coefficient pain severity and fear of movement are a little different and fear of movement also had a prominent role in explanation of disability, so the main point is that pain severity and fear of movement have great influence and strong determinant on physical disability. As a result, in order to better understand the nature of the disability, should be attention to other variables, such as fear of movement. Also, if the goal of the treatment is to reduce disability, it's necessary to consider the variable of fear of movement in the treatment guidelines

Although this study has strong points, such as paying attention to psychological variables affecting the disability of patients with chronic pain and also studying these variables in Iranian patients, has some limitations too. The current study had some limitations. Our study was an observational study in nature, so that we could not infer causal relationships about the findings. Moreover, data were collected by self-report instrument, which can leave our results with some biases. In this regard, it has suggested to use more strong data collection methods and for more generalizable data repeat study in other communities and cultures and patients with other type of pain.

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